

Energy Matters

U.S. Department of Energy, Industrial Technologies Program

Feature

DOE Tools Help Owens Corning Achieve Significant Energy Savings Throughout Its Operations

Through a combination of technical assistance, tools, and training provided by the U.S. Department of Energy's (DOE's) Industrial Technologies Program (ITP), Owens Corning has achieved significant energy savings across its operations. Energy efficiency measures implemented at its Santa Clara, California, plant alone have resulted in significant annual savings—and the company did not stop there. Owens Corning took the knowledge and know-how acquired through its work with ITP and pursued energy efficiency projects on its own. Using DOE software tools, the company conducted a plant-wide energy assessment at one of its fiberglass insulation facilities, which identified energy-savings opportunities that, when fully implemented, will reduce the plant's total energy intensity by 12%.

Background

Headquartered in Toledo, Ohio, Owens Corning is a leading global producer of residential and commercial building materials, glass-fiber reinforcements, and engineered materials for composite systems. A Fortune 500 Company for 56 consecutive years, Owens Corning is committed to driving sustainability by delivering solutions, transforming markets, and enhancing lives. Founded in 1938, Owens Corning is a market-leading innovator of glass-fiber technology with sales of \$4.8 billion in 2009 and about 16,000 employees in 28 countries on 5 continents.

Owens Corning is a company that takes its commitment to energy efficiency very seriously. Each of the company's manufacturing facilities has an appointed "energy leader" who is responsible for the efficiency of the plant's process operations. Energy leaders collaborate with their counterparts at other plants to share ideas and best practices for saving energy and deploying new tools and methodologies to reduce energy use, as well as work closely with local utilities and vendors to implement energy-savings ideas.

Since 2007, Owens Corning has worked closely with DOE in its drive to improve efficiency. The partnership has proved to be incredibly successful and mutually beneficial. The company has taken full advantage of the technical assistance, expertise,

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and tools offered by ITP to achieve significant savings. A prime example of Owens Corning's energy efficiency efforts is its Santa Clara, California, plant.

Achieving Significant Savings in Santa Clara, California

Built in 1949, the Owens Corning Santa Clara, California, facility was the first industrial plant in the United States designed specifically to manufacture insulation. Today, the plant employs 300 people and produces approximately 250 million pounds of insulation annually. Because the plant is served by two large electric furnaces, electricity consumption is significant. The Santa Clara plant is also served by several pumping and fan systems, as well as two compressed air systems. Improving the efficiency of such systems, of which Owens Corning has many, can generate noteworthy energy-savings opportunities.

In 2007, a DOE Energy Expert performed an energy assessment on the Santa Clara plant's pumping systems. The Energy Expert used DOE's Pumping System Assessment Tool (PSAT) to identify several opportunities for reducing pumping system energy use, including consistent operation of the most efficient pumps, retrofitting inefficient pumps, replacing valves, and installing variable speed drives. The combined annual energy savings for pump-related improvements was estimated at more than \$100,000. Subsequently, additional assessments were conducted on the plant's compressed air and fan systems using the respective DOE software tools—the Fan System Assessment Tool (FSAT) and AIRMaster+. The assessments led to the implementation of several energy efficient upgrades, including the installation of variable frequency drives on fans and upgrading to a larger compressor.

Initially, some of the recommendations that were identified during the assessments were too costly to qualify for immediate project financing—the implementation costs were too high to meet the company's established 3-year return on investment requirement. However, financial incentives provided by local utility company, Silicon Valley Power (SVP), enabled Owens Corning to pursue energy-saving measures that were generated from the assessments. SVP leveraged its Customer Directed Rebate program, awarding the Santa Clara facility approximately \$250,000 in rebates.

The recommendations implemented at the Santa Clara plant resulted in aggregate annual energy cost savings of about \$250,000. With \$250,000 in incentives from SVP and implementation costs, the Santa Clara projects yielded a 1.3-year simple payback period.

Applying a Successful Methodology

Large industrial companies, like Owens Corning, often have multiple facilities that manufacture the same product. These similar facilities provide an excellent opportunity to replicate ITP's model for identifying and pursuing energy-savings opportunities. Since receiving its initial energy assessment in 2007, Owens Corning has applied the technical expertise, tools, and training provided by ITP to pursue additional energy efficiency efforts on its own, without direct assistance from DOE.

In 2009, the company conducted a plant-wide energy assessment at one of its fiberglass insulation plants. Plant personnel evaluated the facility's fan, pumping, compressed air, and process heating systems using DOE software tools—FSAT, PSAT, AirMaster+, and the Process Heating Assessment Tool. The assessment resulted in a number of identified improvement opportunities that, when fully implemented, will result in a 12% reduction in the plant's total energy use.

Conclusion

The sustainability projects across Owens Corning's operations have yielded valuable findings related to energy efficiency project planning and implementation, and have allowed the company to achieve substantial energy and cost savings. Leveraging the technical assistance, tools, and resources supplied by ITP not only helped Owens Corning identify efficiency improvement opportunities, but also provided the company with the technical expertise and know-how to replicate similar projects without direct support from DOE. The success Owens Corning has achieved on its own serves as an encouraging example for other energy-conscience companies looking to become more efficient.



Success in Industry

Bentley Prince Street: On a Sustainability “Mission”

As the largest commercial carpet manufacturer in California, Bentley Prince Street produces and ships more than four million yards of carpet each year at its 280,000-square-foot facility. At its City of Industry manufacturing plant, Bentley Prince Street is rapidly becoming recognized for its industry-leading sustainability practices, including a philosophy titled “Mission Zero.”

According to Anthony Minite, president of Bentley Prince Street, the goal of Mission Zero is to eliminate any negative impact the company may have on the environment by 2020. It is also a way for Bentley Prince Street to influence other manufacturers to take action by demonstrating what the manufacturing sector can—and should—be doing to help the environment.

Through the company’s multi-faceted focus on sustainability and commitment to preserving natural resources, Bentley Prince Street has made measurable progress. Using a specially designed EcoMetrics system, the company carefully tracks data in every area of its operations to check progress and refine strategies.

Through strategies that encompass manufacturing processes, product innovations, and renewable energy use, Bentley Prince Street has produced some impressive numbers regarding industrial sustainability:

- Renewable sources provide 100% of electrical energy requirements
- Waste sent to landfills has been reduced by 97% since 1994
- Absolute greenhouse gas emissions have been reduced by 48% since 1996

- Water use per unit has been reduced by 52% since 1994
- Energy use per unit has been reduced by 40% since 1994
- Nitrogen oxide has been reduced by 66% since 1996.

Bentley Prince Street is committed to sustainable commerce and innovations to integrate style and function with environmental practices. With the carpet industry’s most comprehensive vertical carpet manufacturing facility, the company maintains third-party certification to the International Organization for Standardization (ISO) 9001 quality management system and the ISO 14001 environmental management system. Additionally, Bentley Prince Street was just accepted as a Superior Energy Performance (SEP) pilot plant within the California Energy Management Demonstration project that is being supported by the U.S. Department of Energy’s Industrial Technologies Program. As a demonstration site, Bentley Prince Street will test the elements of SEP—a forthcoming American National Standards Institute-accredited energy management certification program currently under development by the U.S. Council for Energy-Efficient Manufacturing. For more information on Energy Management Demonstrations, visit <http://www1.eere.energy.gov/industry/energymanagementdemonstrations/index.html/>.

For more information about Bentley Prince Street’s energy efficiency efforts, contact the company’s Sustainability Manager, Kim Matsoukas, LEED AP BD+C, at (626) 934-2152 or e-mail kimberly.matsoukas@bentleyprincestreet.com.

BENTLEY PRINCE STREET

Johnson Controls Helps Others— and Itself—with Energy Efficiency

For Johnson Controls of Milwaukee, Wisconsin—a company that offers products and services to dramatically improve energy efficiency in buildings—the commitment to sustainability dates back to the company's roots in 1885 with the invention of the first electric room thermostat. The company focuses on its own environmental performance with the same discipline that it applies with its customers, reviewing operations and supply chain to identify continuous improvement opportunities to make products in more earth-friendly ways.

Many of the improvements at Johnson Controls have come to fruition by using the company's own resources. To record, track, forecast, and report energy use and greenhouse gas emissions across its global operations, Johnson Controls uses its own information technology—specifically, the company's Energy and Emissions Management System. At its global headquarters, Johnson Controls is using its new Sustainability Management System to integrate solar energy generation sub-systems with its building management system to provide real-time monitoring, metering, and control.

Additionally, the company's Energy Hunt training and continuous improvement drives culture change toward more efficient energy use and waste elimination. In 2009, 137 low- or no-cost projects resulted in more than \$2.5 million in savings. Another 135 projects are in progress in 2010. These projects have earned Johnson Controls accolades from the U.S. Department of Energy's Industrial Technologies Program (ITP), which recently bestowed an Energy Saver Award on the company for realizing significant energy savings after implementing recommendations that were identified during an ITP sponsored energy assessment. Johnson Controls' Red Oak, Iowa, facility achieved the award by saving more than 10,100 million British thermal units, equaling 9.9% total energy savings.

For more information about Johnson Controls and its energy efficiency efforts, visit <http://www.johnsoncontrols.com>.



States & Utilities Corner

Lt. Governor of Oklahoma Connects Economy and Energy at Regional Utility Workshop

On September 15, 2010, more than 50 government, utility, and industry groups attended the 1-day [*Industrial Energy Efficiency Programs for Utilities: A Workshop*](#), co-sponsored by the U.S. Department of Energy's Industrial Technologies Program (ITP) and the American Public Power Association. The regional utility workshop—held in Oklahoma City, Oklahoma—showcased available tools and resources for supporting industrial energy efficiency and highlighted working best practice utility programs in the region.

"Retaining businesses is important for Oklahoma. The competition to move away is great and we don't want them to leave because of high utility costs. Utilities are an important partner to local communities and have an economic impact on the state."

Jari Askins, *Oklahoma Lieutenant Governor*



Shane Woolbright of Municipal Electric Systems of Oklahoma welcomes attendees; Lieutenant Governor of Oklahoma, Jari Askins, delivers keynote remarks; Sandy Glatt offers information on ITP's tools, training, and assessments; and Bruce Evans discusses CPS Energy's industrial energy efficiency programs in Texas.

The day kicked off with a keynote speech delivered by Oklahoma Lieutenant Governor, Jari Askins. Her remarks centered on the important role utilities play in supporting economic sustainability and growth. This message resounded, reinforcing the sense of urgency for new action in the region that will not only keep industrial customers in utilities' service territories, but also revitalize communities and save jobs.

Utilities and industry from Oklahoma, Kansas, Missouri, and Texas, were represented within both the audience and the day's speakers. The event served as an opportunity to inform utilities in the region about available federal resources. Attendees were provided with specific information about the technical assistance offered by ITP, including tools, training, utility partnership resources, combined heat and power opportunities, and the Industrial Assessment Center program. Moreover, local utilities had the chance to share some of their best practices.

The workshop resulted in utility representatives offering several key take-away messages:

- The Oklahoma Municipal Power Authority (OMPA) leverages industrial customer interest in a peak rate program to attract attention to the energy efficiency programs it offers. Drake Rice, OMPA's director of member services, noted that the utility has also capitalized on American Recovery and Reinvestment Act funds—made available through the Oklahoma Department of Commerce—to offer energy assessments, as well as other resources to its customers.

- CPS Energy serves 60,000 commercial and industrial customers in the State of Texas. In 2009, they received approval for \$849 million in energy efficiency program expenditures through 2020. One of the successful programs they are offering is Lean Clean Energy Tuition. The program pays for half of the costs of energy-management training for its industrial customers.
- A common reason that drives utilities to develop new energy efficiency programs is power generation and new capacity costs. Columbia Water & Light will have a new power plant coming online in two years, but at a cost that is double the anticipated investment. Frank Cunningham, Columbia's energy services supervisor, shared a key result of its 2008 Integrated Resource Plan, which estimates 33 megawatts of potential demand reduction through energy efficiency or 33 megawatt hours per year of potential electrical energy savings through energy efficiency.
- Colin Hansen, executive director of Kansas Municipal Utilities, offered a phrase that resonated with other utility providers and summarized the value of industrial energy efficiency for the workshop's stakeholders: "the cheapest kilowatt hour out there is the one you save."

Moving forward, ITP is challenging other regions in the United States to look at this workshop as a replicable model for local-level utility action.

Tools of the Trade

Steam System Tool Suite

If you consider potential steam system improvements in your plant, the results could be worthwhile. In fact, in many facilities, steam system improvements can save 10% or more in fuel costs. To help you tap into potential savings at your facility, the U.S. Department of Energy's Industrial Technologies Program (ITP) offers the Steam System Tool Suite (SSTS). SSTS is an excellent resource for energy coordinators, facility managers, and plant electricians to diagnose steam system performance. The tool suite consists of three online software tools, including a scoping tool, system assessment tool, and an insulation optimization tool. Each of the tools comes with a user manual or step-by-step guide that allows users to quickly identify opportunities to save both energy and money.

Steam System Scoping Tool

The Steam System Scoping Tool (SSST) helps users perform initial self-assessments of their steam systems. You can evaluate your entire steam system operation and identify the areas that pose the best opportunity for improvement. The tool suggests a range of ways to save energy and boost productivity. It also compares your system against identified best practices and the self-evaluations of similar facilities.

The software asks 26 questions about different areas of your steam system, including system profiling, steam system operating practices, boiler plant operating practices, and distribution and recovery operation practices. Based on your responses, SSST provides a score indicating opportunities for improvement.

Steam System Assessment Tool

The Steam System Assessment Tool (SSAT) helps users develop approximate models of real steam systems. The tool contains all the key components of typical steam systems—boilers, backpressure turbines, condensing turbines, deaerators, letdowns, flash vessels, and feedwater heat exchangers. Using these models, you can apply SSAT to calculate the magnitude—energy, cost, and emissions savings—of potential steam improvement opportunities. The tool also provides energy bill estimates with each improvement scenario.

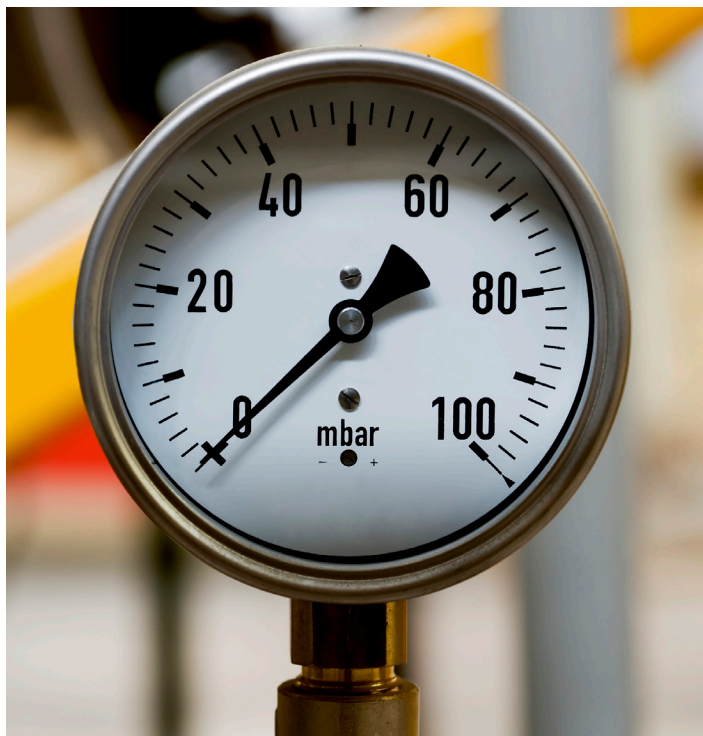
3E Plus®

The 3E Plus® software tool allows users to calculate how much insulation is needed to cost-effectively conserve energy and improve safety by specifying maximum surface temperature.

Inputs

SSTS requires users to input the following information:

- General site data, including power costs, annual operating hours, and water costs
- Steam generation system data for boiler fuels, efficiency, and blowdown rates
- Steam distribution system data for steam turbines, piping insulation, and steam traps and leaks
- Steam end use and condensate systems data for the amount of steam used by processes, and the amount of condensate return
- Maintenance information.



Outputs

Based on your inputs, SSTS summarizes the potential savings of

- Operational costs for fuel, electricity, and water
- Emissions
- Steam costs.

How to Access the Steam System Tool Suite

SSTS can be downloaded for free at http://www1.eere.energy.gov/industry/bestpractices/software_ssats.html.

In addition to SSTS, ITP provides a variety of free software tools to help you identify energy-savings opportunities across your facility. To access these tools, please visit <http://www1.eere.energy.gov/industry/bestpractices/software.html>.

Support and Training

ITP offers a 1-day workshop that covers the operation of typical steam systems and discusses methods of system improvement. The course introduces SSST, SSAT, and 3E Plus. Also, a 2-1/2 day Steam System Specialist Qualification training is offered for steam service providers who are interested in becoming proficient in using ITP's steam tools and references. In addition to the full-day training sessions, ITP also offers a convenient 2-hour Webcast on the use of SSTS. For ease of use, training is also available in two self-paced, e-learning modules. The first module is an alternative to the 1-day workshop; the second provides an overview and teaches you how to use the three steam system tools.

For more information and to sign up for training sessions, visit http://www1.eere.energy.gov/industry/bestpractices/steam_systems.html.

Research & Development

New Aluminum Forging Technique Produces One Millionth Part; Reduces Energy Consumption, Increases Throughput, Improves Quality, and Reduces Costs by 50%

The forging industry has found a new way to decrease energy use, increase throughput, and increase material properties—thanks to efforts by the U.S. Department of Energy's Industrial Technologies Program (ITP). The technique is a new hybrid infrared heating system that is used to preheat aluminum billets prior to forging. The creation of this new system was funded through an ITP grant. Project partners included Oak Ridge National Laboratory, Queen City Forging, Komtek, Infrared Heating Technologies, Northeastern University, and the Forging Industry Association. The team collaborated to design, construct, and implement a viable alternative to traditional gas-fired convection oven heating techniques, which are costly, slow, and energy intensive.

The hybrid rapid infrared technology utilizes tungsten-halogen filaments to rapidly and efficiently heat aluminum billets prior to forging. These filaments emit short-wave infrared radiation, generating temperatures above 2,200° C. This allows for increased heat flux through the oven and aluminum billets,

which reduces preheat times from the 2-1/2 hours it takes for conventional ovens to 14–18 minutes.¹ The system also utilizes convection to provide proper distribution of heat.

In addition to the reduction in preheating time and energy use, an added benefit of the hybrid infrared heating process is the reduction in grain size of the workpiece, which improves the quality of the product. Grain refers to the crystalline structures within the metal. Grain growth was shown to be influenced by a pressure force opposing the growth of grains, called “pinning,” by inter-metallic particles in the alloy. These particles dissolve into solution during prolonged conventional heating methods, but remain intact during shorter infrared heating times.² The pinning effects created by the rapid infrared heating process reduce the grain size in Aluminum 2618 by over 30%.³ Additional testing has shown that rapid heating caused this change, but solution heat treatment and age hardening post forging had no effect on grain size. Further, there is an increase in ultimate tensile strength and yield strength, which are attributed to the reduction in grain size caused by the rapid hybrid infrared heating process.



Improved material characteristics are directly credited to hybrid rapid infrared heating. For example, increased hardness is attributed to the rapid infrared heating processes used in the solution heat-treatment process after forging activities.⁴ Conventionally heat-treated test samples had lower hardness test results. Additionally, fatigue testing (ASTM standard E466-96) with rapid infrared heat-treated samples showed increased fatigue resistance when compared to conventional heating methods.

The potential industry-wide energy savings associated with this technology are substantial. It is estimated that savings could reach 7.2 trillion British thermal units annually in the aluminum forging industry alone. Additionally, cost savings associated with energy reductions and other savings attributed to a switch from traditional aluminum forging methods could result in annual savings of \$84 million.

Infrared billet heating technology is now commercially available. Currently, a hybrid infrared oven is in commercial operation at Queen City Forging in Cincinnati, Ohio. The facility uses this infrared technology to create 2618 Aluminum forgings that are heat-treated using the same technology. The forgings are then sent to TURBOCAM International to be machined into air intake side impellers that are used in Cummins turbo diesel engines. To date, Queen City has produced over one million impeller forgings using this process and has an operational capacity of 1,000 forgings a day.⁵ Queen City Forging has determined that, "Field testing of this hybrid infrared system in full-scale production setup has demonstrated cost savings up to 40–50% through reduced energy consumption, increased throughput, and

improved consistency in the process and quality of the product."⁶ The hybrid rapid infrared heating system was recognized with a 2004 R&D Magazine 100 Award and a 2005 Ohio's Thomas Edison Program Emerging Technology Award.⁷

Endnotes

- ¹ Lu, H., Kadolkar, P. B., Ando, T., Blue, C. A., & Mayer, R. (2004). Control of Grain Size and Age Hardening in AA2618 Forgings Processed by Rapid Infrared Radiant Heating. *The Minerals, Metals, & Materials Society*. <http://www.aluminum-hot-forging.com/QCForge-TMS2004-1-final.pdf>.
- ² Lu, H., Kadolkar, P. B., Ando, T., Blue, C. A., & Mayer, R. (2004). Control of Grain Size and Age Hardening in AA2618 Forgings Processed by Rapid Infrared Radiant Heating. *The Minerals, Metals, & Materials Society*. <http://www.aluminum-hot-forging.com/QCForge-TMS2004-1-final.pdf>.
- ³ Lu, H., Kadolkar, P. B., Ando, T., Blue, C. A., & Mayer, R. (2004). Control of Grain Size and Age Hardening in AA2618 Forgings Processed by Rapid Infrared Radiant Heating. *The Minerals, Metals, & Materials Society*. <http://www.aluminum-hot-forging.com/QCForge-TMS2004-1-final.pdf>.
- ⁴ Kervick, R., et al., Enhancement of Aluminum Alloy Forgings through Rapid Billet Heating, DOE-EERE-ITP, June 2006. http://www.osti.gov/bridge/product.biblio.jsp?query_id=4&page=0&osti_id=886705.
- ⁵ Kervick, R., et al. Enhancement of Aluminum Alloy Forgings through Rapid Billet Heating, DOE-EERE-ITP, June 2006. http://www.osti.gov/bridge/product.biblio.jsp?query_id=4&page=0&osti_id=886705.
- ⁶ Queen City Forging Company, <http://www.qcforge.com/>.
- ⁷ Queen City Forging Company, <http://www.qcforge.com/>.

Implementation

Monthly Webinar Series Assists Companies with Implementation

Each month, the Industrial Technologies Program presents a 1-hour Webinar for plant and corporate energy leaders. These Webinars provide ideas to help address the different challenges that arise when implementing energy assessment recommendations.

The Webinars are hosted by Fred Schoeneborn, president of FCS Consulting Services, Inc. Mr. Schoeneborn has extensive experience in industrial energy efficiency, having spent 38 years with the Mobil Corporation. Mr. Schoeneborn created the company's award-winning global energy management program, saving Mobil \$100 million a year in energy savings.

In addition to Mr. Schoeneborn's expertise, each Webinar features an energy manager from a different company that is actively pursuing ambitious energy efficiency goals. Past guest speakers include Ken Roden, Nissan North America, Inc.; Jeff Yigdall, PPG Industries; Joe Almaguer, Dow Chemical Co.; David Crum and Edwin Willhite, Schneider Electric; Steve Coppinger, CalPortland Company; Walt Brockway, Alcoa; Robert Varcoe, UAW & General Motors; Larry Fabina, ArcelorMittal; and Steve Fugarazzo, Raytheon.

Throughout 2010, the Webinars have covered a number of topics related to the implementation of energy efficiency measures, including preparing for project implementation before,



during, and after an energy assessment; providing resources for implementation; financing project implementation; and measuring energy achievements. Each Webinar is archived on [ITP's Web site](#) for viewing at any time.

The Webinar series will continue in 2011 with a focus on the replication of energy-savings measures.

For more information, contact Lindsay Bixby at lbixby@bcs-hq.com.

Assessment-to-Implementation Workshop Leads to the Development of a Best Practices Guidebook

The *Learning from Success: Assessment-to-Implementation* Best Practices Workshop took place on July 16, 2010. The event was co-hosted and sponsored by the U.S. Department of Energy's Industrial Technologies Program (ITP), Oak Ridge National Laboratory, and the American Public Power Association. This workshop convened a group of 18 industrial energy assessors, as well as energy managers from Alcoa, Nissan North America, Raytheon, and Saint-Gobain—industrial companies that have realized significant savings after implementing recommendations that were identified during energy savings assessments.

During the workshop, the group discussed increasing the rate of assessor recommendation implementation by focusing on the keys to each stage of the assessment process. Participants provided their thoughts on each step of the process, detailing what needs to happen to make a company's energy efficiency efforts productive. Some of the guidance provided includes the following:

- Prior to receiving an assessment, plant management and financial staff need to be engaged to ensure that there is support for energy efficiency projects identified during the assessment.

- Companies receiving assessments should have clear expectations and knowledge about the process, such as the systems that will be examined, what improvements may be identified, and the potential for cost savings and increased productivity.
- Key plant staff should take an active role during the assessment process, selecting the focus of the assessor and understanding the potential risks and rewards of any identified energy-savings measures.
- Following the assessment, key plant staff will need to understand the various hurdles that could prevent implementation and build the proper business case for overcoming those hurdles. This part of the process includes communication activities, measurement and verification, and implementation assistance measures plants and assessors can take to increase implementation rates.

The main goal of the workshop is to create an Industrial Assessment-to-Implementation Best Practices Guidebook, which will be made available by ITP in early 2011. This Guidebook will address activities that need to happen before and during an assessment, as well as post-assessment activities that will increase the implementation of energy-saving recommendations.

For more information about the assessment-to-implementation process, contact Dr. Tony Wright of Oak Ridge National Laboratory at wrightal@ornl.com.

Ask the Energy Expert

Ask the Energy Expert is an ongoing column with the intent of providing information and solutions for some of industry's most pressing questions. This issue's Energy Expert is Richard Miller, corporate energy manager at Mannington Mills. Mr. Miller's role involves developing, coordinating, and implementing the aims and objectives of Mannington Mill's strategies and policies to reduce the company's energy consumption.

Mannington Mills Tackles Sub-Metering System Issues



Dear Energy Expert:

I work as a facilities engineer for a mid-sized manufacturing firm and recently assumed the unofficial title of Energy Manager for our production unit. Lately, we have been experiencing communication gateway issues within our sub-metering system. What challenges has your company faced with its sub-metering system, and how can we capitalize on this experience at our facility?

Mannington Mills is a manufacturer of residential and commercial resilient, laminate, hardwood, and porcelain tile, as well as commercial carpet and rubber floor covering. In business since 1915 and family-owned for four generations,

Mannington Mills operates under the mission of being “the best people to do business with in the flooring industry.”¹ We take extreme pride in our dedication to our products, our customers, and our values.

As a leader in product innovation and environmental stewardship, our organization regards energy as a critical company resource. We view efficiency as an important element of corporate sustainability and effective energy-management strategies. As such, we have developed a rigorous energy-management plan and energy-use and intensity baselines that strengthen our commitment to energy efficiency and place heightened importance on the reduction of industrial energy intensity.

In partnership with the U.S. Department of Energy's Industrial Technologies Program, we have committed to ambitious energy intensity reduction goals.

Metering System

Industrial organizations utilize sub-metering systems to account for and monitor the energy use of their individual facilities. Properly maintained systems allow an organization to establish metrics for these facilities and to gauge their overall energy performance.

Most importantly, though, these systems facilitate the establishment of energy documentation and management systems, capable of handling data from multiple and distinct facilities, and set a precedent of explicable granularity in data reporting.

In 1995, our corporate facility in Salem, New Jersey, was seeking to implement a metering system that would provide us with a picture of our overall and individual facility energy use. We installed 40 Schneider Electric POWERLOGIC® Series 2000 Circuit Monitors throughout our campus. These multi-purpose control monitors featured real-time and demand readings, as well as energy readings and power analysis values.²

However, the system was only set up as a means of performing cost summaries for budget allocation and was owned and operated by our accounting department. Sub-meters were not monitored for energy use or data collection, and software upgrades were not maintained. As a result, the meters fell into disrepair.

By 2008, though, were we beginning to look more closely at our corporate energy-management systems and identified our metering system as problematic. We conducted a comprehensive review of the system and quickly discovered that various control devices on four of our sub-meters were malfunctioning.



Addressing the Issues

We decided to take immediate action to address these issues. We began taking regular, manual meter readings and ran server reports once a week to identify any possible defects in our sub-meters. We contacted United Electric, a local distributor, whose sales staff assembled our original system. They assisted us with a system assessment and partnered with us in a 1-year system-support program to provide remote troubleshooting and onsite support for our meters.

These efforts continue today. We properly maintain our meters with a preventative-maintenance plan that involves our staff recording real-time data and reporting any abnormalities. Another part of our maintenance plan is keeping current with upgraded series software versions.

Our corporate management would also like to ensure that the metering system is addressed as a whole. We are currently in the process of verifying that each wire in the system is functioning and interacting with the system properly. This is being done to ensure that communication gateways and systemic network issues are also addressed. We have also identified the Schneider Electric POWER LOGIC Series 3000 meters as part of our system upgrade. Each unit will cost around \$1,000 and will include all communications software and wiring.

Conclusion

Mannington Mills recognizes that our metering system is vital to our operations and that sub-meters are necessary to maintaining reporting granularity and system accuracy. We feel that the system enables us to communicate to facility managers where they are, what our expectations for them are, and where we need them to go in terms of their performance. Our sub-metering system also helps us to understand energy use patterns and trends. It also helps us evaluate the performance of our facilities' equipment and systems to determine improvement potential as we move into the 21st century.

Endnotes

¹ <http://www.mannington.com/Corporate/OurCompany/History.aspx>.

² <http://www.schneider-electric.us/support/product-support-resources/technical-library/?event=detail&oid=09008926801232d3&cat=0b008926804de527>.

International

On October 17–22, 2010, the International Organization for Standardization (ISO) Project Committee (PC) 242 met in Beijing, China, to address comments on the text of the future ISO 50001—an energy management system standard that will establish and provide a recognized framework for industrial plants, commercial facilities, and/or entire organizations to integrate energy efficiency into their management practices. The goal of the meeting was to modify the Draft International Standard (DIS) and move toward a Final Draft International Standard (FDIS). The meeting involved approximately 90 representatives from 23 countries.

ISO identified the development of international energy management standards as a pressing need—not only because of the significant potential to save energy, but also because of its impact on related emissions. Based on broad applicability across national economic sectors, the future standard could influence up to 60% of the world's energy demand.

The standard will provide companies and organizations with the technical and management strategies needed to continuously increase energy efficiency, reduce costs, and improve environmental performance.

The document is based on the common elements found in all of ISO's management system standards, assuring a high level of compatibility with ISO 9001 (quality management) and ISO 14001 (environmental management). Now that ISO 50001 has advanced to the DIS stage, national member bodies of ISO have been invited to vote and comment on the text of the standard during a 5-month balloting period. If the outcome of the DIS voting is positive, the modified document will then be circulated to the ISO members as a FDIS. If that vote is positive, ISO 50001 is expected to be published as an International Standard in the summer of 2011.

The implementation of ISO 50001 is a central element of Superior Energy Performance (SEP)—a forthcoming American National Standards Institute-accredited energy management certification program currently under development by the U.S. Council for Energy-Efficient Manufacturing (U.S. CEEM). The goal of SEP is to provide industrial facilities with a roadmap for achieving continual improvement in energy efficiency while maintaining competitiveness. The U.S. Department of Energy's (DOE's) Industrial Technologies Program has partnered with U.S. CEEM, as well as U.S. states, regional teams, and utilities to conduct energy management demonstrations to test the elements of SEP and help industrial companies achieve energy-reduction goals through strategic energy management. Sites participating in the demonstration are receiving DOE, state, regional, and utility training and support to implement energy management strategies and the forthcoming ISO 50001 energy management standard. At the close of the demonstration project, plants will be well positioned to pursue certification through SEP and will be prepared to meet ISO 50001 requirements. For more information about the Energy Management Demonstration projects, and for a list of participating companies, states, and regions, visit <http://www1.eere.energy.gov/industry/energymanagementdemonstrations/index.html>.

It is hoped that the introduction of ISO 50001 will result in widespread uptake among all types of energy users, leading to effective energy management, increased efficiency, and more prudent energy use.

For more information about ISO 50001, visit http://www.iso.org/iso/hot_topics/hot_topics_energy/energy_management_system_standard.htm.

Funding Resources

The Office of Energy Efficiency and Renewable Energy (EERE) works with business, industry, universities, and others to increase the use of renewable energy and energy efficiency technologies. One way EERE encourages the growth of these technologies is by offering financial assistance opportunities for their development and demonstration. Visit the [EERE Financial Opportunities Web site](#) to learn about the EERE funding and award process, types of EERE financial assistance, and how to apply.

The Industrial Technologies Program (ITP) offers many opportunities and activities for manufacturers who want to reduce their energy use and improve productivity. ITP uses Funding Opportunity Announcements (FOAs) to contract for cost-shared research and development. These opportunities reflect the priorities of the program and selection of projects follows merit-based criteria that emphasize projected energy, environmental, and economic benefits. Visit [ITP's Web site](#) for active and future opportunities.

Training Opportunities

December 1, 2010

Fundamentals of Compressed Air (Level 1) [Vancouver, Washington]. This is a 1-day introductory workshop designed to teach facility engineers, operators, and maintenance staff how to achieve 15–25% cost savings through more effective production and use of compressed air. Contact: Training Coordinator; 888-720-6823; www.regonline.com/22neca-industrialtraining.

December 2, 2010

Fan Systems Management [High Point, North Carolina]. This 1-day workshop introduces the Fan System Assessment Tool (FSAT), which helps users identify potential areas of optimization, and examines fan system performance characteristics. Contact: Danny Smith; 336-822-2607; danny_smith@mannington.com.

December 7–9, 2010

Specialist Qualification: Steam Systems [Calera, Alabama]. DOE has developed a 2 ½-day Steam System Qualification training for steam service providers who are interested in becoming proficient in using the BestPractices Steam tools. Contact: Keith Woodbury; 205-348-1647; keith.woodbury@ua.edu.

December 7–9, 2010

Specialist Qualification: Pumping Systems [Atlanta, Georgia]. This 2 ½-day workshop covers practical issues involved in field measurements of fluid and electrical data and is designed to qualify industry professionals on the Pumping System Assessment Tool (PSAT). Contact: Linda Schubert; 662-325-7415; Schubert@me.msstate.edu; <http://www.me.msstate.edu/pumptoolworkshop/>.

December 7–10, 2010

Specialist Qualification: AirMaster+ [Appleton, Wisconsin]. This 3 ½-day intensive training explains how AirMaster+ works, how to collect field data, enter data, and interpret the results. Contact: Robin Smith; 414-769-9952; training@focusonenergy.com.

December 8, 2010

Fundamentals of Compressed Air (Level 1) [Billings, Montana]. This is a 1-day introductory workshop designed to teach facility engineers, operators, and maintenance staff how to achieve 15–25% cost savings through more effective production and use of compressed air. Contact: Training Coordinator; 888-720-6823; www.regonline.com/22neca-industrialtraining.

December 10, 2010

Fan Systems Management [Kettering, Ohio]. This 1-day workshop introduces the Fan System Assessment Tool (FSAT), which helps users identify potential areas of optimization, and examines fan system performance characteristics. Contact: Ray Lepore; 937-216-9452; ray.lepore@fastmail.fm.

December 14, 2010

Motor Systems Management [Downey, California]. This 1-day workshop covers motor systems management, including applications, inventory tracking, maintenance, replacement decisions, repair, and the impact and maintenance of power quality. Contact: Larry Bennett; 562-803-7570; lbennett@semprautilities.com.

December 14, 2010

Fundamentals of Compressed Air (Level 1) [Wenatchee, Washington]. This is a 1-day introductory workshop designed to teach facility engineers, operators, and maintenance staff how to achieve 15–25% cost savings through more effective production and use of compressed air. Contact: Training Coordinator; 888-720-6823; www.regonline.com/22neca-industrialtraining.

January 11–13, 2011

Specialist Qualification: Steam Systems [Salt Lake City, Utah]. DOE has developed a 2 ½-day Steam System Qualification training for steam service providers who are interested in becoming proficient in using the BestPractices Steam tools. Contact: Paul Greenwood; 801-639-5648; pgreenwood@nexant.com.

January 12, 2011

Fundamentals of Compressed Air (Level 1) [Downey, California]. This is a 1-day introductory workshop designed to teach facility engineers, operators, and maintenance staff how to achieve 15–25% cost savings through more effective production and use of compressed air. Contact: Larry Bennett; 562-803-7570; lbennett@semprautilities.com.

January 21, 2011

Motor Systems Management [Kettering, Ohio]. This 1-day workshop covers motor systems management, including applications, inventory tracking, maintenance, replacement decisions, repair, and the impact and maintenance of power quality. Contact: Ray Lepore; 937-216-9452; ray.lepore@fastmail.fm.

Tentative: February 16-17, 2011

Advanced Management of Compressed Air (Level 2) [Downey, California]. This intensive 2-day workshop provides in-depth technical information on troubleshooting and making improvements to industrial compressed air systems. Contact: Larry Bennett; 562-803-7570; lbennett@semprautilities.com.

February 18, 2011

Pumping Systems Management [Kettering, Ohio]. This 1-day workshop discusses performance problems encountered in everyday applications and presents the Pumping System Assessment Tool (PSAT). Contact: Ray Lepore; 937-216-9452; ray.lepore@fastmail.fm.

February 28, 2011; March 7, 2011; March 14, 2011; and March 21, 2011

Fundamentals of Compressed Air Systems WE (Web-edition) [Web]. This Web-based version of the popular *Fundamentals of Compressed Air Systems* training uses an interactive format that enables the instructor to diagram examples, give pop quizzes, and answer students' questions in real time. The curriculum will be organized into four 2-hour sessions: (1) Introduction, Why Care About Air and Study Your Supply Side; (2) Understand Your Demands and Are You on Base; (3) Controls; and (4) Maintain System Efficiency, Get with the Plan and Summary-Evaluation. Contact: info@compressedairchallenge.org; www.compressedairchallenge.org.

Look for Us...

ITP Calendar of Events

December 2010

8-10: [World Energy Engineering Congress \(WEEC\)](#)

Industrial Technologies Program Contacts

Click below to request more information about ITP and the services we provide.

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